



# The Binocular Sky

December  
2017

# Newsletter

## Introduction

Welcome to 6<sup>th</sup> Anniversary edition of the **Binocular Sky** Newsletter. Little did I imagine six years ago that it would have as wide a readership as it does. I have greatly appreciated the suggestions for improvement that I get from you, the readership. The most recent has been a request for a DSO listing in RA order – this should happen within the next couple of issues, but I'm tying it in with another couple of projects I have in mind (watch this space!) so as not to triplicate work.



My intention is to highlight some of the binocular (and small telescope) targets for the coming month. This is primarily targeted at binocular observers in the UK, but should have some usefulness for observers anywhere north of Latitude 30°N and possibly even further south.

December nights are, of course, the longest we get in the northern hemisphere, so there is a lot of sky that is observable. If you've not seen Uranus and Neptune before, they are quite well placed early in the evening, so give it a go. Asteroid Iris is also still visible, although it's fading and will be quite tricky by the end of the month, unless you have very good skies.

The Moon goes through the Hyades again this month; watch for the occultation of Aldebaran in the early hours of the 31<sup>st</sup>.

The archetype of the Mira-type variables, Mira (o Cet) itself is now brightening and we can expect it to be an easy naked-eye object next month when its brightness peaks, but it is better placed now, transiting just before 10pm UT.

All the charts are "clicky" and will take you to a higher resolution chart than is possible in the newsletter.

If you would like to receive this newsletter automatically each month, please complete and submit the [subscription form](#). You can get "between the newsletters" alerts, etc. via  and .

## The Deep Sky

*([Hyperlinks](#) will take you to finder charts and more information about the object.)*

December marks the welcome return of the [Pleiades \(M45\)](#) and the [Great Orion Nebula \(M42\)](#) to early evening observation at a reasonable altitude. The [trio of open clusters in Auriga, M36, M37 and M38](#) and [M35 in Gemini](#) are also worth observing. While you are looking at M35, also see if you can identify two smaller open clusters, [NGC 2158](#), which is half a degree to the SE, and the slightly more difficult [IC 2157](#), which is a degree to the ESE. Nearer the Pleiades is [NGC 1647](#), which is within the 'V' asterism of the [Hyades](#). It is a sparse cluster and, although it is visible in a 10x50 binocular, it really benefits from a little more aperture and magnification.

*Open (also called 'Galactic') Clusters are loosely packed groups of stars that are gravitationally bound together; they may contain from a few dozen to a few thousand stars which recently formed in the galactic disk.*

The open cluster [NGC 752](#) is very well placed this month; it is one of those objects that is often overlooked because of its proximity to a more famous object, in this case, the Great Andromeda Galaxy (see below). [NGC 752](#) is a very fine cluster, and easy in 50mm binoculars in which it begins to resolve. Nearby towards Perseus is another fine cluster, [M34](#).

In December, the Milky Way is overhead in the mid-to-late evening. This means that those objects (globular clusters and galaxies) that are outside our galaxy are not as well placed for observation as they are when the Milky Way is low in the sky. Although the bright [M81 \(Bode's Nebula\)](#) and [M82 \(The Cigar Galaxy\)](#), are still relatively easy to observe, even in a 50mm binocular, their altitude is such that you are unlikely to get neck-strain when you do so with straight-through binoculars. [M81](#) and [M82](#) can be used as a good demonstration of averted vision: if you have them both in the same field of view, you may see that the core of [M81](#) becomes more apparent if you look at [M82](#).

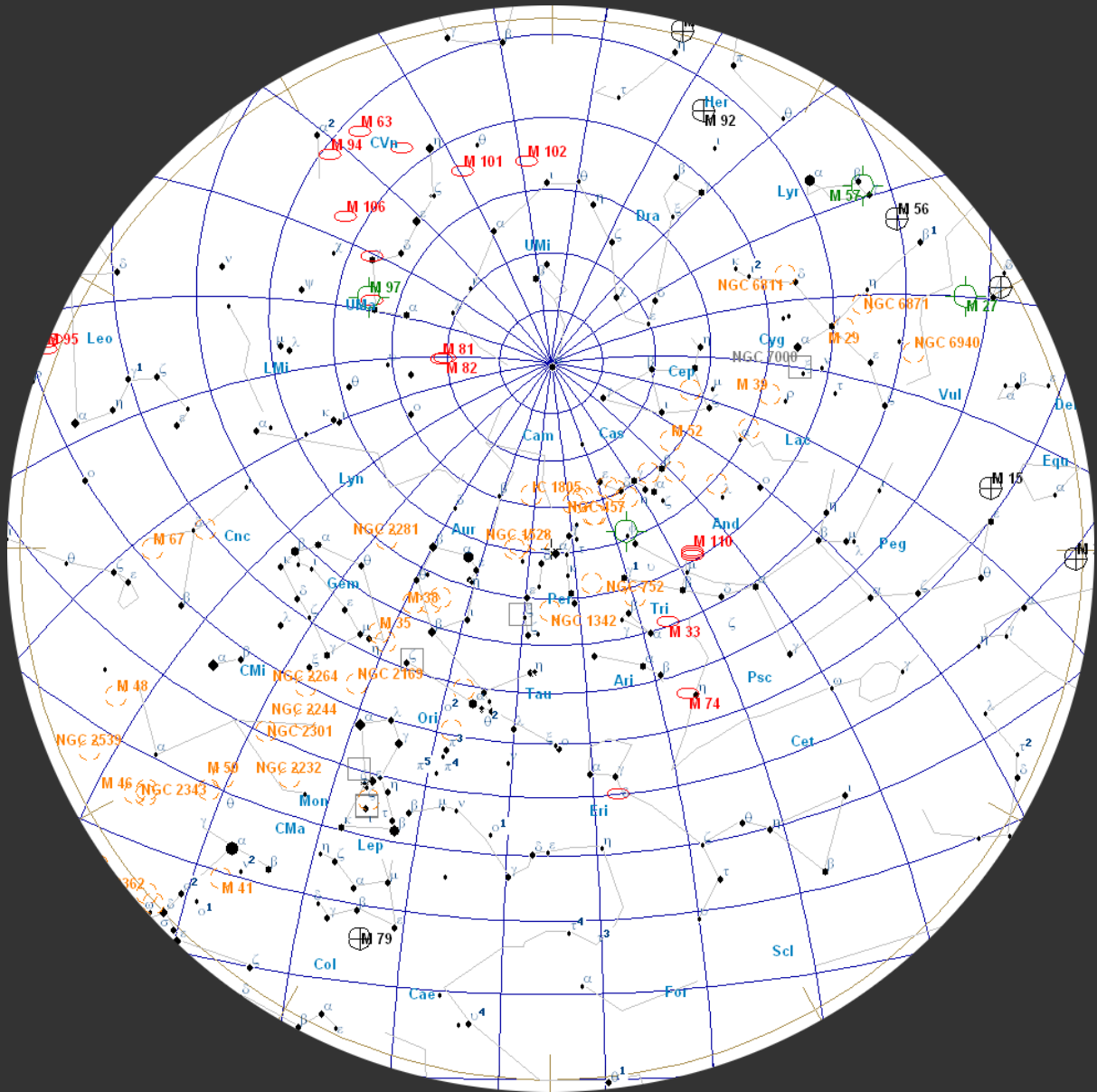
51°N

December 01, 23:00 UT

December 15, 22:00 UT  
UT

December 31, 21:00 UT

(chart is "clicky")



Two notable exceptions to the generalisation of galaxies being poorly placed on December evenings are *The Great Andromeda Galaxy, M31* and *M33 (The Pinwheel)*, both of which are close to the plane of the Milky Way. M31 in particular is very easily visible this month and is a naked eye object in moderately dark skies. It is large and bright enough to be able to withstand quite a lot of light pollution (making it available to urban

*Galaxies are gravitationally bound "island universes" of hundreds of billions of stars at enormous distances. The light that we see from M31, for example, left that galaxy around the time our ancestors of the genus Homo were just evolving!*

observers). M33 has a low surface-brightness and benefits from lower magnification. This generally makes it easier to see in, say, a 10x50 binocular than in many “starter” telescopes.

Of the globular clusters, M15 and M2 are both well placed for observation in December.

*Globular clusters are tightly-bound, and hence approximately spherical, clusters of tens, or even hundreds, of thousands of stars that orbit in a halo around almost all large galaxies that have been observed. They are important for two reasons: Firstly, they contain some of the oldest stars in the galaxy, so studying them helps us understand the evolution of stars. Secondly, they are useful as “standard candles” in establishing a distance scale of the Universe, based on the assumption that the brightest stars in any globular cluster will be approximately the same brightness and that the brightest globulars in a galaxy will be approximately the same brightness.*

For interactive maps of Deep Sky Objects visible from 51°N, please visit:

[http://binocularsky.com/map\\_select.php](http://binocularsky.com/map_select.php)

## Variable Stars

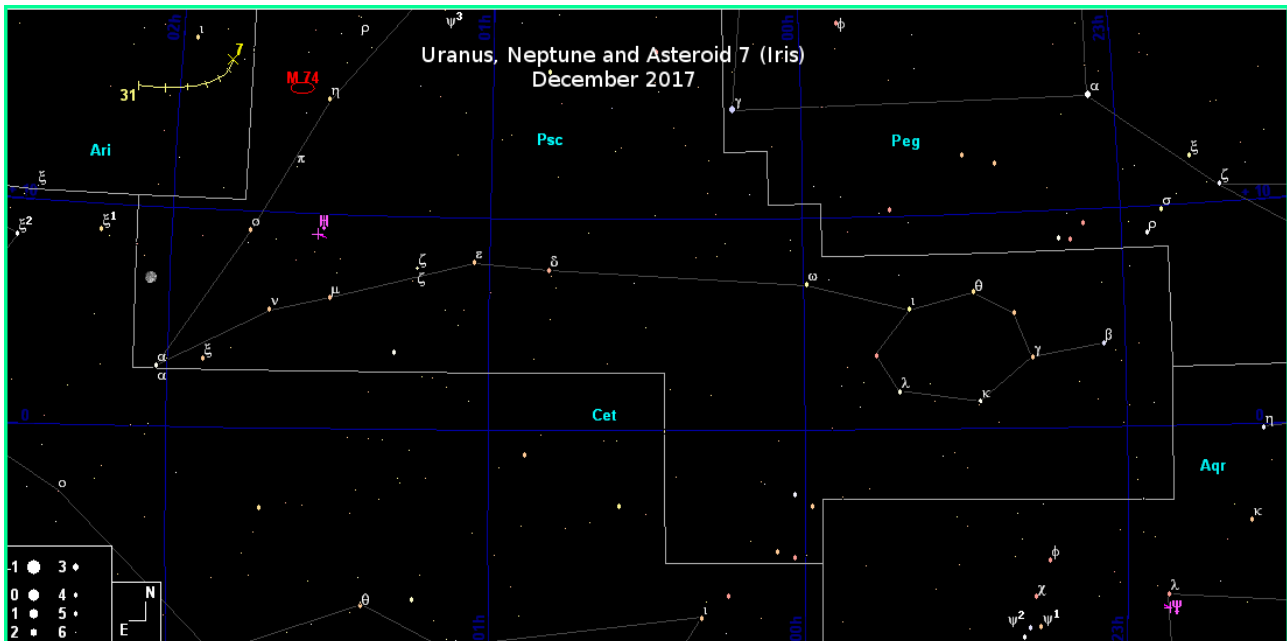
<b>Mira-type stars near predicted maximum (mag &lt; +7.5)</b>		
<b>Star</b>	<b>Mag Range</b>	<b>Period (days)</b>
Mira (o Cet)	3.4-9.3	332

<b>Selection of binocular variables (mag &lt; +7.5)</b>			
<b>Star</b>	<b>Mag Range</b>	<b>Period</b>	<b>Type</b>
XY Lyr	5.8-6.4	Irreg	Irregular
U Sge	6.5-9.3	3.38d	Eclipsing binary
U Vul	6.7-7.5	7.99d	Cepheid
SU Cyg	6.4-7.2	3.84d	Cepheid
U Del	7.0-8.0	ca. 110d	Irregular
TW Peg	7.0-9.2	ca. 90d	Semi-regular
U Cep	6.8-9.2	2.5d (increasing)	Eclipsing binary
V Aqr	7.6-9.4	ca. 244d	Semi-regular
SS Cep	6.7-7.8	ca. 190d	Semi-regular
RZ Cas	6.2-7.7	1.195d	Eclipsing binary

## Double Stars

Binocular Double Stars for December			
Star	Magnitudes	Spectral Types	Separation (arcsec)
ζ Lyr	4.3, 5.6	A3, A3	44
β Lyr	3.6, 6.7	B8, B3	46
OΣ525 Lyr	6.0, 7.6	G0, A0	45
β Cyg	3.1, 4.7	K0, B9	35
d Cep	4.1, 6.1	F5, A0	41
56 And	5.7, 5.9	K0, K2	128
ΣI 1 And	7.1, 7.3	G5, G5	47
ψ-1 Psc	5.3, 5.8	A2, A0	30
14 Ari	5.0, 7.9	F0, F2	106
62 Eri	5.4, 8.9	B9, B8	67
τ Tau	4.3, 7.0	B5, A0	63
ν Gem	4.1, 8.0	B5, A0	113
ζ Gem	4.0, 7.6	G0, G	101
π-1 Umi	6.6, 7.2	G5, G5	31

## The Solar System (charts are 'clicky')



**Neptune** is quite well placed at the onset of astronomical darkness, 38 arcmin to the south of λ Aqr,. It sets just before midnight at the beginning of

the month, and two hours earlier by month end. It remains a steady mag. +7.9 ; during the month it moves only 23 arcminutes (prograde).

**Uranus** is also available from the onset of twilight, but sets before 04:00 at the beginning of the month and two hours earlier by month end. It is much brighter than Neptune, at mag. +5.7, dimming only slightly to +5.8 during the month. It starts the month just over three degrees west of *o Psc*, its position changing by 26 arcminutes west-southwest (retrograde) during December.

**Asteroid 7 (Iris)** is easy to find, starting the month four degrees south of *Sharatan* ( $\beta$  Ari). It fades from mag. +7.7 to +8.5 during the month.

### **Meteor Showers**

The Moon is very favourable for the most reliable of major showers, the **Geminids**, which is active for the last 3 weeks of the month and has its peak predicted for the evening of the 13<sup>th</sup>, with a ZHR of 120 to 160 (it has been intensifying in recent years). Most meteors are due to debris left by comets, but the Geminid shower is one of two (the other is the Quadrantid shower, which peaks on January 03) that originates from an asteroid, in this case asteroid **3200 Phaethon**. You can use binoculars to examine the persistence of any ionisation trails from these slow-moving, colourful meteors.

### **Asteroid Occultations**

There are no predicted asteroid occultations of stars mag +7.5 or brighter this month.

### **Comets**

There are no comets suitable for medium-sized binoculars visible this month.

## Lunar Occultations

Data are for my location and may vary by several minutes for other UK locations. The types are **(D)**isappearance, **(R)**eappearance and **(Gr)**aze; they are all dark-limb events unless there is a **(B)**.

Lunar Occultations, Dec 2017, 50.9°N, 1.8°W							Position Angle
Date	Time	Phase	Star	Spectrum	Magnitude	Cusp Angle	
Dec 01	00:37:16	D	HIP 9785	F0	6.8	84S	69
Dec 02	04:17:50	D	HIP 14764	B8	6.0	59S	91
Dec 05	03:15:38	R	71 Ori	F6	5.2	26S	218
Dec 06	22:57:12	R	HIP 40342	A0	6.5	17S	212
Dec 08	22:13:03	R	Regulus	B7	1.4	58S	258
Dec 11	01:03:07	R	HIP 58377	M4	6.7	68N	316
Dec 14	05:15:18	R	HIP 70784	K0	6.6	72S	275
Dec 23	18:46:51	D	42 Aqr	K1	5.3	71N	52
Dec 28	19:19:15	D	ξ-2 Cet	B9	4.3	76S	82
Dec 28	20:30:06	R (B)	ξ-2 Cet	B9	4.3	-71S	229
Dec 29	19:05:09	D	HIP 15850	K0	6.0	88N	68
Dec 29	20:50:39	D	HIP 16905	A0	6.3	51S	109
Dec 29	23:02:45	D	5 Tau	K0	4.1	19S	141
Dec 29	23:29:22	R (B)	5 Tau	K0	4.1	-25S	186
Dec 30	17:04:07	D	γ Tau	G8	3.7	69S	92
Dec 30	17:59:41	R (B)	γ Tau	G8	3.7	-72S	234
Dec 30	19:53:03	D	70 Tau	F7	6.6	41S	122
Dec 30	21:17:07	D	75 Tau	K2	5.0	89S	73
Dec 30	21:41:07	D	HIP 20816	F7	6.7	35S	128
Dec 31	01:14:06	D	Aldebaran	K5	0.9	33S	129
Dec 31	01:57:26	R (B)	Aldebaran	K5	0.9	-52S	214
Dec 31	20:01:25	D	HIP25702	A2	6.7	55S	107
Dec 31	21:22:40	D	119 Tau	M2	4.3	75S	88
Dec 31	22:04:03	D	120 Tau	B2	5.7	51S	111
Dec 31	22:32:27	R (B)	119 Tau	M2	4.3	-89N	253

## The Moon

December 03	Full Moon
December 10	Last Quarter
December 18	New Moon
December 26	First Quarter

## Public Outreach & Talks

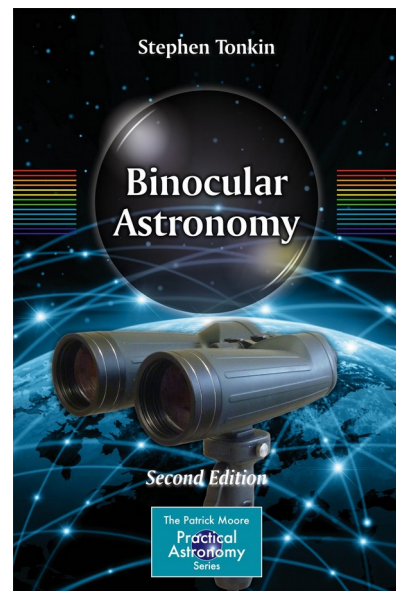
During December I will be at the following event; please do come and say "Hello" if you attend:

13<sup>th</sup>: [Fordingbridge Astronomers](#)      **Public Geminid Watch**

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The **Binocular Sky Newsletter** will always be free to anyone who wants it, but if you would like to support it, there are a number of options:

- Purchase my book, [Binocular Astronomy](#):  
Click on the image for more information
- Make a purchase via the affiliate links in the [Binocular Sky shopfront](#)
- Make a small PayPal donation to [newsletter@binocularsky.com](mailto:newsletter@binocularsky.com)



Wishing you Clear Dark Skies,

**Steve Tonkin**

for

**[The Binocular Sky](#)**

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### Acknowledgements:

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Variable star data based on David Levy's *Observing Variable Stars*  
Occultation data derived with Dave Herald's *Occult*

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